ENGINEER'S STICKER:	CONTRACTOR'S STICKER:

A	Issued for approval	MB	MB	MB	17/11/2021
تنقيح REV.	سبب الإصدار ISSUED FOR	بواسط PREPARED	راجعها CHECKED	وافق عليها APPROVED	التاريخ DATE

المملكة العربيـــة الســـعوديـــة

KINGDOM OF SAUDI ARABIA

المؤسسة العـامـــة لتحليـــة الميـــاه المالحـــة

SALINE WATER CONVERSION CORPORATION (SWCC)

Project No.
1550

نظام نقل مياه الجبيل – الرياض

Jubail – Riyadh Water Transmission System

محطة خزانات الخرج

AL-KHARJ Reservoir Station

المهندس
ENGINEER

المقـــاول
CONTRACTOR

RTCC
شركـــة الراشـــد للتجـــارة والمقـــاولات
AL-RASHID TRADING & CONTRACTING CO.

LOW VOLTAGE POWER CABLES LIST

DOCUMENT No.													SHEET	REV.
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FINAL ENGINEERING

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1. DOCUMENT SCOPE.

The document shall list out the low voltage power cables utilized for the new radial distribution network implemented to power the different low voltage consumers at **KAJRS Reservoir Station**.

For the purpose of this document, the utilized low voltage cables at the tank farm can be split into (3) three main groups based on the type of load as follows…

- The 400/230 V primary power feeders of the new centralized distribution switchboard & other sub-distribution switchboards.
- The 400/230 V final branch circuits inside the buildings and shafts.
- The 230 V UPS consumers' feeders.

2. OTHER REFERENCE DOCUMENTATION.

For the purpose of this document, the following documentation shall be referenced to…

- **49 – QP20 – T – 401**: Station LV distribution system design one-line diagrams.
- **49 – QC20 – J – 402**: Station LV power supply and distribution systems criteria report.
- **49 – QC20 – J – 403**: Station LV power supply system interface engineering report.
- **49 – YE10 – L – 401**: Station LV consumers load list.
- **49 – YE10 – L – 402**: Station LV power supply and distribution systems equipment designation list.
- **49 – QC40 – H – 401**: Station LV distribution switchboards shop-drawings and material specifications.
- **49 – QP10 – S – 301**: Al-Kharj new reservoir station – P&I diagram.

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3. LOW VOLTAGE POWER CABLES LISTS.

3.1. GROUP (1): PRIMARY POWER DISTRIBUTION AND SUB-DISTRIBUTION FEEDERS.

This group shall include the low voltage feeders to…

- The centralized distribution switchboard,
- The buildings lighting-small power consumers sub-distribution switchboards,
- The steel tank internal & external cathodic protection unit,
- The station piping cathodic protection unit, and
- The motorized-operated valves actuators.

See **GROUP (1)** cables list table attached at next page.

Spec. No. QC10-H-092_0 (E12)

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KINGDOM OF SAUDI ARABIA
Saline Water Conversion Corporation
AL-KHARJ RESERVOIR STATION

Subject: **LOW VOLTAGE POWER CABLES LIST**

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Subcontractor

Contractor

Final Engineering

AL-RASHID TRADING & CONTRACTING CO.

GROUP (1): PRIMARY POWER DISTRIBUTION AND SUB-DISTRIBUTION FEEDERS

#	FROM			TO			APPROX. LENGTH PER CIRCUIT RUN (m.)	NO. OF PARALLEL CIRCUITS PER PHASE	CABLE TYPE AND SIZE	CABLE TAG NUMBER	CIRCUIT PROTECTIVE EARTH (PE) CONDUCTOR
	EQUIPMENT TAG NUMBER	EQUIPMENT DESCRIPTION	LOCATION	EQUIPMENT TAG NUMBER	EQUIPMENT DESCRIPTION	LOCATION					
1	MLT2-1.1	LOW VOLTAGE INTERFACE FEEDER	NWC EXISTING PLANT - LV SWITCHGEA	49CB01	CENTRALIZED DISTRIBUTION SWITCHBOARD	ELECTRICAL BUILDING	300	2	4CX240 mm² Cu, XLPE/PVC	49CB01A01	1CX240 mm² Cu, PVC (Y/G)
2	49CB01	CENTRALIZED DISTRIBUTION SWITCHBOARD	ELECTRICAL BUILDING	49DC01	ELELCTRICAL BUILDING LIGHTING-SMALL POWER CONSUMERS SUB-DISTRIBUTION PANEL	ELECTRICAL BUILDING	5	1	4CX35 mm² Cu, XLPE/PVC	49CB01A02	1CX16 mm² Cu, PVC (Y/G)
3				49DO01	STATION OUTDOOR LIGHTING SYSTEMS SUB-DISTRIBUTION PANEL	ELECTRICAL BUILDING	5	1	4CX35 mm² Cu, XLPE/PVC	49CB01A03	1CX16 mm² Cu, PVC (Y/G)
4				49DI01	TANK INLET CONTROL VALVE SHAFT LIGHTING-SMALL POWER CONSUMERS SUB-DISTRIBUTION PANEL	TANK INLET CONTROL VALVE SHAFT	230	1	4CX35 mm² Cu, XLPE/PVC	49CB01A04	1CX16 mm² Cu, PVC (Y/G)
5				49DI02	FUTURE CONNECTION VALVE SHAFT LIGHTING-SMALL POWER CONSUMERS SUB-DISTRIBUTION PANEL	FUTURE CONNECTION VALVE SHAFT	162	1	4CX35 mm² Cu, XLPE/PVC	49CB01A05	1CX16 mm² Cu, PVC (Y/G)
6				49DI03	TANK OUTLET CONTROL VALVE SHAFT LIGHTING-SMALL POWER CONSUMERS SUB-DISTRIBUTION PANEL	TANK OUTLET CONTROL VALVE SHAFT	115	1	4CX35 mm² Cu, XLPE/PVC	49CB01A06	1CX16 mm² Cu, PVC (Y/G)
7				49DI04	GUARD HOUSE LIGHTING-SMALL POWER CONSUMERS SUB-DISTRIBUTION PANEL	GUARD HOUSE BUILDING	155	1	4CX35 mm² Cu, XLPE/PVC	49CB01A07	1CX16 mm² Cu, PVC (Y/G)
8				49EA01	230 VAC, 5.0 kVA UPS MAIN AC INPUT-1	ELECTRICAL BUILDING	5	1	3CX6 mm² Cu, XLPE/PVC	49CB01A08	*NOTE (1)*
9				49EA02	230 VAC, 5.0 kVA UPS MAIN AC INPUT-2	ELECTRICAL BUILDING	5	1	3CX6 mm² Cu, XLPE/PVC	49CB01A09	*NOTE (1)*
10				49HR01S001	STATION PIPING CATHODIC PROTECTION SYSTEM TRANSFORMER-RECTIFIER UNIT	OUTDOOR PLATFORM	60	1	4CX6 mm² Cu, XLPE/PVC	49CB01A10	1CX6 mm² Cu, PVC (Y/G)
11				49HR01S002	STEEL TANK INTERNAL & EXTERNAL CATHODIC PROTECTION SYSTEM TRANSFORMER-RECTIFIER UNIT	OUTDOOR PLATFORM	110	1	4CX10 mm² Cu, XLPE/PVC	49CB01A11	1CX10 mm² Cu, PVC (Y/G)
12				T1AKJBV1001	TANK INLET CONTROL SHAFT BUTTERFLY MOTOR-OPERATED VALVE	TANK INLET CONTROL VALVE SHAFT	230	1	4CX6 mm² Cu, XLPE/PVC	49CB01A12	*NOTE (2)*
13				T1AKJCV1001	STEEL TANK INLET CONTROL SHAFT FLOW CONTROL MOTOR-OPERATED VALVE	TANK INLET CONTROL VALVE SHAFT	230	1	4CX6 mm² Cu, XLPE/PVC	49CB01A13	*NOTE (2)*
14				T1AKJBV1006	FUTURE CONNECTION VALVE SHAFT MOTOR-OPERATED VALVE	FUTURE CONNECTION VALVE SHAFT	170	1	4CX6 mm² Cu, XLPE/PVC	49CB01A14	*NOTE (2)*
15				T1AKJBV1002	TANK INLET BUTTERFLY MOTOR-OPERATED VALVE	OUTDOOR PLATFORM	135	1	4CX6 mm² Cu, XLPE/PVC	49CB01A15	*NOTE (2)*
16				T1AKJBV1003	TANK OUTLET BUTTERFLY MOTOR-OPERATED VALVE	OUTDOOR PLATFORM	95	1	4CX6 mm² Cu, XLPE/PVC	49CB01A16	*NOTE (2)*
17				T1AKJBV1004	TANK OUTLET CONTROL SHAFT BUTTERFLY MOTOR-OPERATED VALVE-1	TANK OUTLET CONTROL VALVE SHAFT	115	1	4CX6 mm² Cu, XLPE/PVC	49CB01A17	*NOTE (2)*
18				T1AKJCV1002	STEEL TANK OUTLET CONTROL SHAFT FLOW CONTROL MOTOR-OPERATED VALVE	TANK OUTLET CONTROL VALVE SHAFT	115	1	4CX6 mm² Cu, XLPE/PVC	49CB01A18	*NOTE (2)*
19				T1AKJBV1005	TANK OUTLET CONTROL SHAFT BUTTERFLY MOTOR-OPERATED VALVE-2	TANK OUTLET CONTROL VALVE SHAFT	115	1	4CX6 mm² Cu, XLPE/PVC	49CB01A19	*NOTE (2)*

NOTES:

1. THE CIRCUIT IS A SINGLE-PHASE SUPPLIED. THEREFORE, ONE OF THE THREE CORES SHALL BE UTILIZED AS PROTECTIVE EARTH (PE) CONDUCTOR PROVIDED THAT THE REGULATIONS OF THE NEC TO BE APPLIED, WHERE (YELLOW/GREEN) TAPE IS NECESSARY TO BE WRAPPED AROUND THAT CORE EXPOSED XLPE SHEATH, AT BOTH CABLE ENDS, IN ORDER CLEARLY IDENTIFY ITS PURPOSE AS PROTECTIVE EARTH TO ALL PERSONNEL.

2. THE MOTOR-OPERATED VALVES ACTUATORS AND THEIR AUMA CONTROLLERS ARE THREE-PHASE LOADS THAT DON'T NEED A NEUTRAL WIRE. THEREFORE, THE 4th BLACK CORE SHALL BE UTILIZED AS PROTECTION EARTH (PE) CONDUCTOR PROVIDED THAT THE REGULATIONS OF THE NEC TO BE APPLIED, WHERE (YELLOW/GREEN) TAPE IS NECESSARY TO BE WRAPPED AROUND THAT CORE EXPOSED XLPE SHEATH, AT BOTH CABLE ENDS, IN ORDER CLEARLY IDENTIFY ITS PURPOSE AS PROTECTIVE EARTH TO ALL PERSONNEL.

3.2. GROUP (2): BUILDINGS FINAL BRANCH CIRCUITS FEEDERS.

This group shall include the low voltage feeders to…

- The indoor lighting system circuits.
- The outdoor lighting circuits.
- The buildings 13 A. 1-phase normal sockets circuits.
- The buildings 16 A. 3-phase power sockets circuits.
- The buildings HVAC system circuits, e.g., air conditioning & ventilation loads.

See **GROUP (2)** cables list table attached at next page.

GROUP (2): FINAL BRANCH CIRCUITS FEEDERS								
#	FROM	TO	APPROX. LENGTH PER CIRCUIT RUN (m.)	NO. OF PARALLEL CIRCUITS PER PHASE	CABLE TYPE AND SIZE	CIRCUIT PROTECTIVE EARTH (PE) CONDUCTOR	CABLE TAG NUMBER	CIRCUIT DESCRIPTION
1	49DC01	L01	15	1	3CX2.5 mm² Cu, XLPE/PVC	*NOTE (1)*	49DC01A01	LV & CC CABINETS ROOM NORMAL LIGHTING CIRCUIT
2		L02	12	1	3CX2.5 mm² Cu, XLPE/PVC	*NOTE (1)*	49DC01A02	BATTERY ROOM LIGHTING CIRCUIT
3		L03	16	1	3CX2.5 mm² Cu, XLPE/PVC	*NOTE (1)*	49DC01A03	BUILDING OUTDOOR LIGHTING CIRCUIT
4		SP01	11	1	4CX4 mm² Cu, XLPE/PVC	1CX4 mm² Cu, PVC (Y/G)	49DC01A04	LV & CC CABINETS ROOM 16 A. - 3PH+N+E POWER SOCKET CIRCUIT
5		SP02	12	1	4CX4 mm² Cu, XLPE/PVC	1CX4 mm² Cu, PVC (Y/G)	49DC01A05	BATTERY ROOM 16 A. - 3PH+N+E POWER SOCKET CIRCUIT
6		SN01	9	1	3CX4 mm² Cu, XLPE/PVC	*NOTE (1)*	49DC01A06	LV & CC CABINETS ROOM 13 A. - 1PH+N+E NORMAL SOCKETS CIRCUIT
7		SN02	10	1	3CX4 mm² Cu, XLPE/PVC	*NOTE (1)*	49DC01A07	BATTERY ROOM 13 A. - 1PH+N+E NORMAL SOCKETS CIRCUIT
8		SPARE	-	-	-	-	-	-
9		SPARE	-	-	-	-	-	-
10		A/C PACU	5	1	4CX10 mm² Cu, XLPE/PVC	1CX10 mm² Cu, PVC (Y/G)	49DC01A10	BUILDING AIR CONDITIONING PACKAGE UNIT CIRCUIT
11		SPARE	-	-	-	-	-	-
12		SPARE	-	-	-	-	-	-
13		EF01	12	1	3CX2.5 mm² Cu, XLPE/PVC	*NOTE (1)*	49DC01A13	BATTERY ROOM EXHAUST FAN CIRCUIT
14	49DO01	RL01	162	1	4CX6 mm² Cu, XLPE/STA/PVC	1CX6 mm² Cu, PVC (Y/G)	49DO01A01	ROADWAY LIGHTING CIRCUIT
15		RL02	297	1	4CX6 mm² Cu, XLPE/STA/PVC	1CX6 mm² Cu, PVC (Y/G)	49DO01A02	ROADWAY LIGHTING CIRCUIT
16		SPARE	-	-	-	-	-	-
17		SPARE	-	-	-	-	-	-
18		SL01	209	1	3CX6 mm² Cu, XLPE/SWA/PVC	*NOTE (1)*	49DO01A05	SPECIAL TASK AREAS LIGHTING CIRCUIT
19		SPARE	-	-	-	-	-	-
20	49DI01	L01	43	1	3CX2.5 mm² Cu, XLPE/PVC	*NOTE (1)*	49DI01A01	SHAFT LIGHTING CIRCUIT
21		SPARE	-	-	-	-	-	-
22		SN01	21	1	3CX4 mm² Cu, XLPE/PVC	*NOTE (1)*	49DI01A03	SHAFT 13 A. - 1PH+N+E NORMAL SOCKET CIRCUIT
23		SP01	25	1	4CX4 mm² Cu, XLPE/PVC	1CX4 mm² Cu, PVC (Y/G)	49DI01A04	SHAFT 16 A. - 3PH+N+E POWER SOCKET CIRCUIT
24		SPARE	-	-	-	-	-	-
25		SPARE	-	-	-	-	-	-
26	49DI02	L01	12	1	3CX2.5 mm² Cu, XLPE/PVC	*NOTE (1)*	49DI02A01	SHAFT LIGHTING CIRCUIT
27		SN01	6	1	3CX4 mm² Cu, XLPE/PVC	*NOTE (1)*	49DI02A02	SHAFT 13 A. - 1PH+N+E NORMAL SOCKET CIRCUIT
28		SPARE	-	-	-	-	-	-
29		SP01	10	1	4CX4 mm² Cu, XLPE/PVC	1CX4 mm² Cu, PVC (Y/G)	49DI02A04	SHAFT 16 A. - 3PH+N+E POWER SOCKET CIRCUIT
30		SPARE	-	-	-	-	-	-
31		SPARE	-	-	-	-	-	-
32	49DI03	SN01	43	1	3CX4 mm² Cu, XLPE/PVC	*NOTE (1)*	49DI03A01	SHAFT 13 A. - 1PH+N+E NORMAL SOCKET CIRCUIT
33		L01	21	1	3CX2.5 mm² Cu, XLPE/PVC	*NOTE (1)*	49DI03A02	SHAFT LIGHTING CIRCUIT
34		SPARE	-	-	-	-	-	-
35		SP01	25	1	4CX4 mm² Cu, XLPE/PVC	1CX4 mm² Cu, PVC (Y/G)	49DI03A03	SHAFT 16 A. - 3PH+N+E POWER SOCKET CIRCUIT
36		SPARE	-	-	-	-	-	-
37		SPARE	-	-	-	-	-	-
38	49DI04	SPARE	-	-	-	-	-	-
39		L01	13	1	3CX2.5 mm² Cu, XLPE/PVC	*NOTE (1)*	49DI04A02	GUARDS ROOM LIGHTING CIRCUIT
40		L03	3	1	3CX2.5 mm² Cu, XLPE/PVC	*NOTE (1)*	49DI04A03	BUILDING OUTDOOR LIGHTING CIRCUIT
41		SPARE	-	-	-	-	-	-
42		GB01	15	1	3CX2.5 mm² Cu, XLPE/PVC	*NOTE (1)*	49DI04A04	AUTOMATIC GATE BARRIER CIRCUIT
43		L02	8	1	3CX2.5 mm² Cu, XLPE/PVC	*NOTE (1)*	49DI04A05	LAVATORY ROOM LIGHTING CIRCUIT
44		CO01	8	1	3CX4 mm² Cu, XLPE/PVC	*NOTE (1)*	49DI04A06	TEA AREA COOKER CIRCUIT
45		EF01	11	1	3CX2.5 mm² Cu, XLPE/PVC	*NOTE (1)*	49DI04A07	LAVATORY ROOM EXHAUST FAN CIRCUIT
46		SPARE	-	-	-	-	-	-
47		WH01	11	1	3CX4 mm² Cu, XLPE/PVC	*NOTE (1)*	49DI04A08	LAVATORY ROOM WATER HEATER CIRCUIT
48		SN01	9	1	3CX4 mm² Cu, XLPE/PVC	*NOTE (1)*	49DI04A09	GUARDS ROOM 13 A. - 1PH+N+E+ NORMAL SOCKETS CIRCUIT
49		A/C01	15	1	3CX6 mm² Cu, XLPE/PVC	*NOTE (1)*	49DI04A10	GUARDS ROOM AIR CONDITIONING SPLIT UNIT CIRCUIT
50		SPARE	-	-	-	-	-	-

NOTES:

1. THE CIRCUIT IS A SINGLE-PHASE SUPPLIED. THEREFORE, ONE OF THE THREE CORES SHALL BE UTILIZED AS PROTECTIVE EARTH (PE) CONDUCTOR PROVIDED THAT THE REGULATIONS OF THE NEC TO BE APPLIED, WHERE (YELLOW/GREEN) TAPE IS NECESSARY TO BE WRAPPED AROUND THAT CORE EXPOSED XLPE SHEATH, AT BOTH CABLE ENDS, IN ORDER CLEARLY IDENTIFY ITS PURPOSE AS PROTECTIVE EARTH TO ALL PERSONNEL.

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GROUP (3): UPS CONSUMERS FEEDERS.

This group shall include the low voltage feeders to…

- The new DCS cabinet power supplies.
- The new DCS cabinet auxiliary loads.
- The local fire alarm control panel power supply.
- The auxiliary control voltage for the centralized distribution switchboard and sub-distribution panels.
- The station piping electro-magnetic flow meters' transmitters.
- UPS supplied lighting circuits. (*Applicable only at the Electrical building – LV & CC cabinets room*)

See **GROUP (3)** cables list table attached at next page.

Spec. No. QC10-H-092_0 (E12)

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KINGDOM OF SAUDI ARABIA
Saline Water Conversion Corporation
AL-KHARJ RESERVOIR STATION

Subject: **LOW VOLTAGE POWER CABLES LIST**

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Subcontractor

Contractor

Final Engineering

AL-RASHID TRADING & CONTRACTING CO.

GROUP (3): UPS CONSUMERS FEEDERS

#	FROM			TO			APPROX. LENGTH PER CIRCUIT RUN (m.)	NO. OF PARALLEL CIRCUITS PER PHASE	CABLE TYPE AND SIZE	CABLE TAG NUMBER	CIRCUIT PROTECTIVE EARTH (PE) CONDUCTOR
	EQUIPMENT TAG NUMBER	EQUIPMENT DESCRIPTION	LOCATION	EQUIPMENT TAG NUMBER	EQUIPMENT DESCRIPTION	LOCATION					
1	49EC01	230 VAC UPS DISTRIBUTION PANEL	ELECTRICAL BUILDING	C01	(49CB01) AUX. & CONTROL VOLTAGE SUPPLY	ELECTRICAL BUILDING	5	1	3CX2.5 mm² Cu, XLPE/PVC	49EC01A01	*NOTE (1)*
2				C02	(49DC01) AUX. & CONTROL VOLTAGE SUPPLY	ELECTRICAL BUILDING	6	1	3CX2.5 mm² Cu, XLPE/PVC	49EC01A02	*NOTE (1)*
3				C03	(49DO01) AUX. & CONTROL VOLTAGE SUPPLY	ELECTRICAL BUILDING	5	1	3CX2.5 mm² Cu, XLPE/PVC	49EC01A03	*NOTE (1)*
4				C04	(49GA01) DCS CABINET CONTROL VOLTAGE SUPPLY-1	ELECTRICAL BUILDING	7	1	3CX2.5 mm² Cu, XLPE/PVC	49EC01A04	*NOTE (1)*
5				C05	(49GA01) DCS CABINET CONTROL VOLTAGE SUPPLY-2	ELECTRICAL BUILDING	7	1	3CX2.5 mm² Cu, XLPE/PVC	49EC01A05	*NOTE (1)*
6				C06	(49GA01) DCS CABINET AUXILIARY VOLTAGE SUPPLY	ELECTRICAL BUILDING	7	1	3CX2.5 mm² Cu, XLPE/PVC	49EC01A06	*NOTE (1)*
7				C07	(49UF01) FIRE ALARM CONTROL PANEL POWER SUPPLY	ELECTRICAL BUILDING	7	1	3CX2.5 mm² Cu, XLPE/PVC	49EC01A07	*NOTE (1)*
8				C08	(T1AKB49CF001) TANK INLET FLOW METER TRANSMITTER POWER SUPPLY	TANK INLET CONTROL VALVE SHAFT	230	1	3CX6 mm² Cu, XLPE/PVC	49EC01A08	*NOTE (1)*
9				C09	(T1AKB49CF002) TANK OUTLET FLOW METER TRANSMITTER POWER SUPPLY	TANK OUTLET CONTROL VALVE SHAFT	115	1	3CX6 mm² Cu, XLPE/PVC	49EC01A09	*NOTE (1)*
10				C10	LV & CC CABINETS ROOM UPS BASED LIGHTING CIRCUIT	ELECTRICAL BUILDING	4	1	3CX2.5 mm² Cu, XLPE/PVC	49EC01A10	*NOTE (1)*
11				SPARE	-	-	-	-	-	-	-
12				SPARE	-	-	-	-	-	-	-
13				SPARE	-	-	-	-	-	-	-

NOTES:

1. THE CIRCUIT IS A SINGLE-PHASE SUPPLIED. THEREFORE, ONE OF THE THREE CORES SHALL BE UTILIZED AS PROTECTIVE EARTH (PE) CONDUCTOR PROVIDED THAT THE REGULATIONS OF THE NEC TO BE APPLIED, WHERE (YELLOW/GREEN) TAPE IS NECESSARY TO BE WRAPPED AROUND THAT CORE EXPOSED XLPE SHEATH, AT BOTH CABLE ENDS, IN ORDER CLEARLY IDENTIFY ITS PURPOSE AS PROTECTIVE EARTH TO ALL PERSONNEL.